Your Guide to the Latest in Immunization Practice

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Disclosures

• Jeff Goad is on the speakers bureau for Merck and an advisor for Sanofi Pasteur, PaxVax and Travax.

• Stephan Foster is on an advisory board with Pfizer and on speakers bureaus with Pfizer, Merck, Seqirus, and Sanofi-Pasteur
Supporter

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CPE Information

• Target Audience: Pharmacists and Pharmacy Technicians
• ACPE#: 0202-0000-19-070-L06-P/T
• Activity Type: Application-Based
Learning Objectives

• Identify and apply important recent changes to the immunization schedules for adults and children in the United States to representative patient cases.

• Describe specific immunization recommendations for special populations, including health care professionals, immunocompromised individuals, and pregnant women.

• Discuss the epidemiology of outbreaks of vaccine-preventable diseases in the United States.

• Summarize information about the efficacy and possible adverse effects of recently licensed vaccines.

• List promising new vaccines in the development pipeline.
1. Which group of individuals is now being targeted for Hepatitis A vaccination
   A. Primate lab workers
   B. International travelers
   C. Homeless
   D. Children
2. Rates for invasive pneumococcal disease in ≥ 65 yr olds ____ since the introduction of the PCV7/13 in children.
   A. increased
   B. decreased
   C. have not been affected
3. The FDA indication for 9vHPV is which of the following?
   A. 9-45 years, males and females
   B. 9-26 years, males and females
   C. 9-26 years females, 9-21 years males
   D. 11-12 years, males and females
4. In the 2017-2018 influenza season, which age group had the LOWEST influenza vaccine effectiveness?

A. 6 mos – 8 years  
B. 18-49 years  
C. 50-64 years  
D. *≥65 years
5. What is the shortest interval to complete the primary series of JE-VC for a person traveling to a JE endemic region for greater than 1 month duration?

   A. 7 days
   B. 14 days
   C. 28 days
   D. 6 months
2019 Schedules

https://www.cdc.gov/vaccines/schedules/hcp/index.html
2019 Adult Immunization Schedule Changes

• Appearance

• Updated Recommendations
  • Hepatitis B
  • Tdap
  • Influenza
  • Hepatitis A

• Usability Testing

• Additional Recommendations for Pregnancy
  • Indicated during pregnancy
  • May be given in certain populations
  • Contraindicated
  • May be initiated postpartum or when breastfeeding or both

• Harmonizing language, text structure, graphics, notes
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

**Vaccines in the Child and Adolescent Immunization Schedule**

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Abbreviations</th>
<th>Trade names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis vaccine</td>
<td>DTaP</td>
<td>DTap</td>
</tr>
<tr>
<td>Diphtheria, tetanus vaccine</td>
<td>DT</td>
<td>DTw</td>
</tr>
<tr>
<td>Haemophilus influenza type b vaccine</td>
<td>Hib (PRP-T)</td>
<td>ActHIB</td>
</tr>
<tr>
<td>Haemophilus influenza type b vaccine</td>
<td>Hib (PRP-OMP)</td>
<td>Prednis</td>
</tr>
<tr>
<td>Hepatitis A vaccine</td>
<td>HAVa</td>
<td>Havrix</td>
</tr>
<tr>
<td>Hepatitis B vaccine</td>
<td>HBV</td>
<td>Recombivax HB</td>
</tr>
<tr>
<td>Human papillomavirus vaccine</td>
<td>HPV</td>
<td>Gardasil 9</td>
</tr>
<tr>
<td>Influenza vaccine (inactivated)</td>
<td>IIV</td>
<td>Fluvax</td>
</tr>
<tr>
<td>Influenza vaccine (live, attenuated)</td>
<td>IIV</td>
<td>Fluzone</td>
</tr>
<tr>
<td>Mumps, measles, and rubella vaccine</td>
<td>MMR</td>
<td>M-M-R</td>
</tr>
<tr>
<td>Meningococcal serogroups A, C, W, Y vaccine</td>
<td>MenACWY-D</td>
<td>Menactra</td>
</tr>
<tr>
<td>Meningococcal serogroups B, C vaccine</td>
<td>MenACWY-B</td>
<td>Menveo</td>
</tr>
<tr>
<td>Meningococcal serogroup A vaccine</td>
<td>MenACWY-A</td>
<td>Menactra</td>
</tr>
<tr>
<td>Meningococcal serogroup C vaccine</td>
<td>MenACWY-C</td>
<td>Menveo</td>
</tr>
<tr>
<td>Pneumococcal 11-valent conjugate vaccine</td>
<td>PCV11</td>
<td>Prevnar 13</td>
</tr>
<tr>
<td>Pneumococcal 23-valent polysaccharide vaccine</td>
<td>PCV23</td>
<td>Prevenar VC</td>
</tr>
<tr>
<td>Poliovirus vaccine (inactivated)</td>
<td>IPV</td>
<td>IPV</td>
</tr>
<tr>
<td>Rotavirus vaccine</td>
<td>RV1, RV5</td>
<td>Rotarix, Rotarix for 6mth</td>
</tr>
<tr>
<td>Tetanus, diphtheria, and acellular pertussis vaccine</td>
<td>TdA</td>
<td>Adacel</td>
</tr>
<tr>
<td>Tetanus and diphtheria vaccine</td>
<td>Td</td>
<td>Bactoite</td>
</tr>
<tr>
<td>Varicella vaccine</td>
<td>VV</td>
<td>Varicella</td>
</tr>
</tbody>
</table>

**Combination Vaccines (for combination vaccines instead of separate injections when appropriate)**

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Abbreviations</th>
<th>Trade names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, tetanus, and inactivated poliovirus vaccine</td>
<td>DTap-HepB-IPV</td>
<td>PreHexa</td>
</tr>
<tr>
<td>Diphtheria, inactivated poliovirus, and Haemophilus influenza type b vaccine</td>
<td>DTaP-Hibb-Hib</td>
<td>Polodiz</td>
</tr>
<tr>
<td>Diphtheria and inactivated poliovirus vaccine</td>
<td>DTaP-IPV</td>
<td>Kinesrix Queso</td>
</tr>
<tr>
<td>Meningococcal serogroup B, C vaccine</td>
<td>MenACWY-B</td>
<td>Menveo</td>
</tr>
<tr>
<td>Meningococcal serogroup C vaccine</td>
<td>MenACWY-C</td>
<td>Menactra</td>
</tr>
</tbody>
</table>

**How to use the child/adolescent immunization schedule**

1. Determine recommended vaccine by age (Table 1)
2. Determine recommended interval for catch-up vaccination (Table 2)
3. Assess need for additional recommended vaccines by medical condition and other indications (Table 3)
4. Review vaccine types, frequencies, intervals, and considerations for special situations (Table 4)

**Recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American Academy of Pediatrics (www.aap.org), American Academy of Family Physicians (www.aafp.org), and American College of Obstetricians and Gynecologists (www.acog.org).**

**Report**
- Unexplained cases of reportable vaccine-preventable diseases or outbreaks to your state or local health department.
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or (800-822-7967)

**Helpful Information**
- Complete ACIP recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- General Best Practice Guidelines for immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Outbreak Information (including case identification and outbreak responses, see Manual for the Surveillance of Vaccine-Preventable Diseases: www.cdc.gov/vaccines/pubs/surv-manual/index.html

**U.S. Department of Health and Human Services:**
- Centers for Disease Control and Prevention
**Table 1** Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger  
**United States, 2019**

These recommendations must be read with the Notes that follow. For those who fall behind on start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Table 1. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are studied in gray.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>0-1 mos</th>
<th>2-6 mos</th>
<th>6 mos</th>
<th>12 mos</th>
<th>18 mos</th>
<th>19-23 mos</th>
<th>23-35 mos</th>
<th>36-46 mos</th>
<th>47-64 mos</th>
<th>65 yrs+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B ( HepB)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotavirus (RV) (2-dose series; RV5 [3-dose series])</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria, tetanus, &amp; acellular pertussis (DTaP&lt;7 yrs)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Haemophilus influenza type b (Hib)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated poliovirus (IPV&lt;18 yrs)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza (IV)</td>
<td>Annual vaccination 1 or 2 doses</td>
<td>Annual vaccination 1 or 2 doses</td>
<td>Annual vaccination 1 dose only</td>
<td>Annual vaccination 1 dose only</td>
<td></td>
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<tr>
<td>Influenza (LAIV)</td>
<td></td>
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</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>See Notes</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Varicella (VAR)</td>
<td></td>
<td></td>
<td>1st dose</td>
<td>2nd dose</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td>See Notes</td>
<td></td>
<td>2 dose series</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Meningococcal (Meningococcal C [MCV4], 23v polysaccharide vaccine)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, &amp; acellular pertussis (Tdap&lt;7 yrs)</td>
<td></td>
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<tr>
<td>Human papillomavirus (HPV)</td>
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<tr>
<td>Meningococcal B</td>
<td>See Notes</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>See Notes</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

- Range of recommended ages for all children
- Range of recommended ages for catch-up immunization
- Range of recommended ages for certain high-risk groups
- Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision making
- No recommendation
### Table 2
Catch-up immunization schedule for persons aged 4 months—18 years who start late or who are more than 1 month behind, United States, 2019

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child’s age. Always use this table in conjunction with Table 1 and the notes that follow.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 2 to Dose 3</th>
<th>Minimum Age for Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Minimum Age for Dose 4</th>
<th>Dose 4 to Dose 5</th>
<th>Minimum Age for Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>Birth</td>
<td>4 weeks</td>
<td>8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.</td>
<td></td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Bacteriuria</td>
<td>&lt;6 weeks</td>
<td>4 weeks</td>
<td>6 weeks</td>
<td>Maximum age for final dose is 9 months; 0 days.</td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Diphtheria, tetanus, and</td>
<td>Maximum age for first</td>
<td>6 weeks</td>
<td>8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.</td>
<td></td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>and other pertussis type b</td>
<td>doses is 14 weeks, 6 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td>0 weeks</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugates</td>
<td>0 weeks</td>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated polio</td>
<td>0 weeks</td>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>3 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>12 months</td>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marburg virus</td>
<td>2 months* Measles2*</td>
<td>8 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Children and adolescents age 7 through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 2 to Dose 3</th>
<th>Minimum Age for Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Minimum Age for Dose 4</th>
<th>Dose 4 to Dose 5</th>
<th>Minimum Age for Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>7 years</td>
<td>4 weeks</td>
<td>6 weeks</td>
<td>If first dose of OPV/W was administered before the 1st birthday.</td>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
<td>6 months</td>
</tr>
<tr>
<td>Varicella</td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated polio</td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>6 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>3 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 2 to Dose 3</th>
<th>Minimum Age for Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Minimum Age for Dose 4</th>
<th>Dose 4 to Dose 5</th>
<th>Minimum Age for Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis, mumps, rubella, and other pertussis</td>
<td>0 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugates</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated polio</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 2 to Dose 3</th>
<th>Minimum Age for Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Minimum Age for Dose 4</th>
<th>Dose 4 to Dose 5</th>
<th>Minimum Age for Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>0 weeks</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated polio</td>
<td>0 weeks</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Measles if OPV/W is administered before the 1st birthday.

4 weeks and at least 16 weeks after first dose.

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.

6 months

A fourth dose of IPV is scheduled if all previous doses were administered at ≥5 years of age if the third dose was administered ≤5 months after the second dose.
### Table 3
Recommended Child and Adolescent Immunization Schedule by Medical Indication
United States, 2019

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>PREGNANCY</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
<th>HIV infection CD4+ count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Immunocompromised status (excluding HIV infection)</td>
<td>≤1% and total CD4 cell count of &lt;200/mm³</td>
<td>&gt;1% and total CD4 cell count of ≥200/mm³</td>
<td>Kidney failure, end-stage renal disease, or hemodialysis</td>
<td>Heart disease, chronic lung disease</td>
<td>CSE leaks, cochlear implants</td>
<td>Asplenia and persistent complement deficiencies</td>
<td>Chronic liver disease</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pneumococcal conjugate</td>
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<tr>
<td>Influenza (A)</td>
<td></td>
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<tr>
<td>Influenza (B)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mumps, measles, rubella</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal ACWY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria &amp; acellular pertussis (Tdap)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**1** For additional information regarding HIV laboratory parameters and use of live vaccines, see the General Adult and Pediatric Guidelines for Immunization "Altered Immunocompetence." [Website](https://www.cdc.gov/nip/policies/gp385.htm) and Table 34 "Additional Information and Recommendations." [Website](https://www.cdc.gov/nip/policies/gp385.htm).

**2** Severe Combined Immunodeficiency

**3** SIV contraindicated for children 2-4 years of age with asthma or wheezing during the preceding 12 months.

---

16
# Table 1  
**Recommended Adult Immunization Schedule by Age Group**  
**United States, 2019**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–21 years</th>
<th>22–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza inactivated (IIV) or Influenza recombinant (RIV)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Influenza live attenuated (LAIV)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Tdap or Td)</td>
<td>1 dose Tdap, then 1d booster every 10 yrs</td>
<td>1 dose Tdap, then 1d booster every 10 yrs</td>
<td>1 dose Tdap, then 1d booster every 10 yrs</td>
<td>1 dose Tdap, then 1d booster every 10 yrs</td>
<td>1 dose Tdap, then 1d booster every 10 yrs</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>2 doses (if born in 1996 or later)</td>
<td>2 doses (if born in 1996 or later)</td>
<td>2 doses (if born in 1996 or later)</td>
<td>2 doses (if born in 1996 or later)</td>
<td>2 doses (if born in 1996 or later)</td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Zoster recombiant (ZEV) (preferred)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Zoster live (ZVL)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Hepatitis A (+hepA)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Hepatitis B (+hepB)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Haemophilus influenza type b (+Hib)</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
</tbody>
</table>

![Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection. Recommended vaccination for adults with an additional risk factor or another indication. No recommendation.](image)
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV Infection CD4 count</th>
<th>Asplenia, complement deficiencies</th>
<th>End-stage renal disease, on hemodialysis</th>
<th>Heart or lung disease, alcoholism</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
<th>Health care personnel</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tdap or Td</td>
<td>CONTRAINDICATED</td>
<td>1 dose Tdap each pregnancy</td>
<td>1 dose Tdap, then Td booster every 10 yrs</td>
<td>2 doses at age ≥50 yrs</td>
<td>1 dose at age ≥60 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td>CONTRAINDICATED</td>
<td>1 or 2 doses depending on indication</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR</td>
<td>CONTRAINDICATED</td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RZV (preferred) or ZVL</td>
<td>CONTRAINDICATED</td>
<td>2 doses at age ≥50 yrs</td>
<td>1 dose at age ≥60 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Female</td>
<td>DELAY</td>
<td>3 doses through age 26 yrs</td>
<td>2 or 3 doses through age 26 yrs</td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>HPV Male</td>
<td>3 doses through age 26 yrs</td>
<td>2 or 3 doses through age 21 yrs</td>
<td>2 or 3 doses through age 26 yrs</td>
<td></td>
<td></td>
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<tr>
<td>PCV13</td>
<td>1 dose</td>
<td>1 dose</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPSV23</td>
<td>1, 2, or 3 doses depending on age and indication</td>
<td>2 or 3 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepA</td>
<td>2 or 3 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepB</td>
<td>2 or 3 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenACWY</td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenB</td>
<td>PRECAUTION</td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>3 doses HSCT recipients only</td>
<td>1 dose</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Recommended vaccination for adults who meet age requirements, lack recency of recent vaccination, or lack evidence of prior infection.
2. Recommended vaccination for adults with an additional risk factor or another indication.
3. Precaution—vaccine might be indicated if benefits of protection outweigh risk of adverse reaction.
4. Delay vaccination until after pregnancy if vaccine is indicated.
5. Contraindicated—vaccine should not be administered because of risk for serious adverse reaction.

Table 2: Recommended Adult Immunization Schedule by Medical Condition and Other Indications
United States, 2019
Redesigned Notes Pages

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2019

For vaccine recommendations for persons 19 years of age and older, see the Recommended Adult Immunization Schedule. Additional Information

• Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.

• For information on contraindications and precautions for the use of a vaccine, consult the General Best Practice Guidelines for Immunization and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html.

• For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥4 weeks are determined by calendar months.

• Within a number range (e.g., 12–18), a dash (–) should be read as “through.”

• Vaccine doses administered ≥4 days before the minimum age or interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum age or minimum interval should not be counted as valid and should be repeated as age-appropriate. The repeat dose should be spaced after the initial dose by the recommended minimum interval. For further details, see Table 3.1, Recommended and minimum ages and intervals between vaccine doses, in General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timeing.html.

• Information on travel vaccine recommendations and requirements is available at www.cdc.gov/travel.


• For information regarding vaccination in the setting of a vaccine-preventable disease outbreak, contact your state or local health department.

• The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury claims. All routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information, see www.hrsa.gov/vaccinecompensation/index.html.

### Diphtheria, tetanus, and pertussis (DTP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadracel])

#### Routine vaccination

• 5-dose series at 2, 4, 6, 11–18 months, 4–6 years

• Prospective: Dose 4 may be given as early as age 12 months if ≥6 months have elapsed since dose 3.

• Retrospective: A 4th dose that was inadvertently given as early as 12 months may be counted if at least 4 months have elapsed since dose 3.

#### Catch-up vaccination

• Dose 5 is not necessary if dose 4 was administered at age 4 years or older.

• For other catch-up guidance, see Table 2.

### Haemophilus influenzae type b vaccination (minimum age: 6 weeks)

#### Routine vaccination

• ActHIB, Hiberies, or Pentacel: 4-dose series at 2, 4, 6, 12–15 months

• PedvaxHIB: 3-dose series at 2, 4, 12–15 months

#### Catch-up vaccination

• Dose 1 at 2–11 months: Administer dose 2 at least 4 weeks later and dose 3 (final dose) at 12–15 months or 8 weeks after dose 2 (whichever is later).

• Dose 1 at 12–14 months: Administer dose 2 (final dose) at least 8 weeks after dose 1.

• Dose 1 before 12 months and dose 2 before 15 months: Administer dose 3 (final dose) 8 weeks after dose 2.

• 2 doses of PedvaxHIB before 12 months: Administer dose 8 (final dose) at 12–15 months and at least 8 weeks after dose 2.

• Unvaccinated at 15–59 months: 1 dose

• For other catch-up guidance, see Table 2.

### Special situations

• Chemotherapy or radiation treatment: 12–59 months:

• Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.

• 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

• Doses administered within 14 days of starting therapy or during therapy should be repeated at least 3 months after therapy completion.

• Hematopoietic stem cell transplant (HSCT): 0–2 doses 8 weeks apart starting at 4–12 months after successful transplant regardless of HIV vaccination history

• Anatomic or functional asplenia (including sickle cell disease):

• 12–59 months:

• Unvaccinated or only 1 dose before 12 months: 2 doses, 8 weeks apart.

• 2 or more doses before 12 months: 1 dose at least 8 weeks after previous dose.

• Unvaccinated persons age 5 years or older

• 1 dose

• Elective splenectomy:

• Unvaccinated persons age 12 months or older

• 1 dose (preferably at least 14 days before procedure).

• HIV infection:

• 12–59 months:

• Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.

• 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

• Unvaccinated persons age 5–18 years:

• 1 dose

• Immunoglobulin deficiency, early component complement deficiency:

• 12–59 months:

• Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.

• 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

• Unvaccinated < 1 year:

• Less explanations, more administration guidelines
General Best Practice Guidelines for Immunization
General Best Practice Guidelines for Immunization

- New Name for General Recommendations
  - [https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)
- Web-based platform
  - Able to change each section as needed unlike print version
- CE Courses – self-study
- Can be downloaded and printed
Changes in Best Practices

• DTaP
  • Precautions removed
    • Fever $>105$
    • Persistent Crying
    • Collapse or Shock-like State
    • Seizure within 72 hours

• Minimal Intervals for MenB vaccines

• Hepatitis A
  • Doses of IG updated
  • IG and vaccine should be administered in different limbs
• Varicella
  • Contraindication – family history of altered immunocompetence
    • Congenital immunodeficiencies
  • Precautions
    • ASA – delay use of aspirin for 6 weeks (Reye’s syndrome)
    • Receipt of antiherpesvirus antivirals (24 hours before and 14 days after vaccination)

• Zoster (RZV)
  • Only 0.5ml withdrawn (even if vial is overfilled)
  • This does not apply to other vaccines

• LAIV
  • No antivirals within previous 48 hours
• May Healthcare workers with labeled contraindications/precautions administer vaccines?
  • Historically – LAIV, Smallpox, Veterinary Medicine
  • Proposed Language

Providers are sometimes concerned when they have the same contraindications or precautions as their patients from whom they withhold or defer vaccine. For administration of routinely recommended vaccines, there is no evidence of risk of exposure of vaccine antigen to the health care provider, so conditions in the provider labeled as contraindications and precautions to a vaccine antigen are not a reason to withdraw from this function of administering the vaccine antigen to someone else.
Epidemiology Updates
Measles Outbreaks

- Washington state
  - Pacific NW among the lowest in the nation
  - 18 states allow philosophical exemptions
  - Clark county Washington is epicenter of this year
    - 71 cases this year
    - 78% MMR vaccination rate, some schools as low as 40%

- Previous outbreaks
  - 2018 – Orthodox Jewish (NY/NJ)
  - 2017 – Somali-Americans (MN)
  - 2015 – Disneyland (CA)

https://www.cdc.gov/measles/cases-outbreaks.html
## Pregnancy: Tdap and Influenza Vaccination

<table>
<thead>
<tr>
<th>Category</th>
<th>Influenza (%)</th>
<th>Tdap (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccinated during pregnancy</td>
<td>54.4%</td>
<td>54.4%</td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>52.5%</td>
<td>59.3%</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>35.6%</td>
<td>48.8%</td>
</tr>
<tr>
<td>Provider vaccination survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offered</td>
<td>63.8%</td>
<td>73.5%</td>
</tr>
<tr>
<td>Recommended, no offer</td>
<td>37.6%</td>
<td>38.3%</td>
</tr>
<tr>
<td>Recommended, no offer, referral</td>
<td>47.9%</td>
<td>56.1%</td>
</tr>
<tr>
<td>Recommended, no offer or referral</td>
<td>30.1%</td>
<td>18.5%</td>
</tr>
<tr>
<td>No recommendation</td>
<td>9%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

*MMWR. Weekly / September 28, 2018 / 67(38);1055–1059*
Vaccine Updates
Pneumococcal
2014 ACIP Recommendation for Immunocompetent Adults >65 Years

• Approved addition of PCV13 in series with PPSV23
• Short-term recommendation to protect anticipating indirect effect herd immunity from children
• Long-term benefit may mostly be due to herd immunity from pediatric PCV13 vaccination
• 4-year policy re-evaluation (2018)
  • Monitor disease,
  • Indirect and direct effects of vaccination
  • Safety
Pneumococcal Conjugate Vaccine

- PCV7 for children (2000)
- PCV13 for children (2010)
- PCV13 for individuals with immunocompromising conditions (2012-2013)
- PCV13 in series with PPSV23 for adults \( \geq 65 \text{ years old} \) (2014)
- Evaluation of PCV13 in adults \( \geq 65 \text{ years old} \) (presently)
IPD Rates – Children < 5 years old

Presented at Oct. 2018 ACIP meeting. Active Bacterial Core surveillance data.
IPD Rates – Adults ≥ 65 years

Presented at Oct. 2018 ACIP meeting. Active Bacterial Core surveillance data.
IPD – PCV13 Serotypes in children <5 years old

Presented at Oct. 2018 ACIP meeting. Active Bacterial Core surveillance data.
IPD – PCV13 Serotypes in ≥ 65 years old

Presented at Oct. 2018 ACIP meeting. Active Bacterial Core surveillance data.
Impact of PCV13 on Pneumococcal Pneumonia

• Surveillance for Non-invasive Pneumococcal Pneumonia (SNiPP)
  • Built into Active Bacterial Core Surveillance (ABCs)
  • Cases with radiologically confirmed pneumonia and positive UAD test

• High Burden of Disease
• Most decreases before 2014
• No decrease after 2014
• Similar to IPD incidence

Presented at Oct. 2018 ACIP meeting
Evidence Presented to Date

• Nasopharyngeal carriage (Colonization)
  • Children
    • PCV13 types declined from 8% in 2011 to 0.3% in 2017
    • Total *S. pneumoniae* carriage – no change (30%)
  • Adults ≥65 years
    • 0.2% in 2015-16
    • Total carriage low – 1.8%

• PCV13 coverage in adults ≥65 years ~40%

• No serotype replacement
ACIP Evidence to Recommendation (EtR) Framework

- Statement of problem
  - Public health priority
  - Burden of disease
- Benefits and harms
  - Balance of desirable and undesirable effects
  - Certainty in evidence
- Values and preference of target population
- Acceptability to stakeholders
- Resource use
  - Health economic analysis
- Feasibility
  - Implementation considerations
Policy Question: Should PCV13 be administered routinely to all immunocompetent adults aged $\geq 65$ years in the context of indirect effects from pediatric PCV use experienced to date?
• Statement of Problem
  • PCV13-type IPD
    • Incidence has declined since 2000 PCV7 introduction and 2010 PCV13 introduction
    • PCV13 serotypes account for 20% of all IPD
      • Serotype 3 (66%), 19A (13%), 7F (13%), 19F (12%)
  • PCV13-type Noninvasive Pneumococcal Pneumonia
    • Majority of disease in older adults but difficult to measure
    • 3.7% disease caused by PCV13 serotypes
      • Serotype 3 (37%), 19A (28%), 6A (12%), 5 (9%), 7F (7%)
    • 35% relative reduction due to indirect effects - most seen before 2014
    • Combined Direct and Indirect effects in PCV13 types – 31% relative reduction 2014-2016
• Statement of problem
  • Public health priority
  • Burden of disease

• Is the PCV13-type disease burden still of public health importance?

Workgroup (Judgements):

- No
- Probably No
- Uncertain
- Probably Yes
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• *Is the PCV13-type disease burden still of public health importance?*

Workgroup (Judgements) :

- No
- Probably No
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Examples of Evidence Presented to Date

• Pneumococcal Pneumonia
  • CAPITA (Pfizer) 46% reduction
  • Louisville Pneumonia Study (Pfizer)
    • 31% relative reduction from June 2014-May 2016 in adults >65 years
    • Suggests a direct effect
  • Native American Study
    • Indirect effects substantial due to PCV13 in infants
    • 26% of confirmed pneumococcal pneumonia
      • 6% PCV13 type almost all caused by serotype 3

• Safety
  • No new safety signals
• Benefits and harms – (with GRADE)
  • Balance of desirable and undesirable effects
    • Vaccine Efficacy/Effectiveness (Depending upon study)
      • PCV13-type pneumonia – 45%, 71%, 38%
      • Non-invasive pneumococcal pneumonia – 43%, 68%
      • All cause pneumonia – 8%, 6-11%
      • IPD – 47 and 59%
    • Number needed to vaccinate
      • PCV13-type IPD – 26,300
      • PCV13-type pneumonia, inpatient – 3,000-14,000
      • PCV13-type pneumonia, outpatient – 2,600

• How substantial are the desirable anticipated effects?
  Workgroup (Judgements) :
  Minimal  Small  Moderate  Large

• What is the overall certainty of this evidence for the critical outcomes?
  Workgroup (Judgements) :
  Very Low  Low  Moderate  High
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Two New Pneumococcal Conjugate Vaccines

- PCV15 and PCV20 in Phase 3 trial
- Both attempting licensure in adults first
- PCV15
  - Serotypes PCV13 plus 22F and 33F
- PCV20
  - Serotypes PCV13 plus 8, 10A, 11A, 12F, 15B, 22F, and 33F

Submission to FDA - ? 2020 - 2022
• Values and preference of target population
  • Very little evidence
  • Pneumonia perceived as severe
  • Low perceived susceptibility

• Does the target population feel that the desirable effects are large relative to the undesirable effects?

  Workgroup (Judgements) :

  No  Probably No  Uncertain  Probably Yes  Yes

• Acceptability to stakeholders
  • Current recommendations are confusing to providers
  • Providers recommend continuing current recommendations
  • Best programmatically with new vaccines on horizon
  • Reimbursement still a problem – Medicare part D

• Is the intervention acceptable to key stakeholders?

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Workgroup Perspective - EtR

- Resource use
  - Health economic analysis

**Resources Used: Comparison of 2013 vs 2019**

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<tr>
<th></th>
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<tbody>
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<td>IPD Cases</td>
<td>-226</td>
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*Source: ACIP Meeting Slide – Feb 2019*

- **Is the intervention a reasonable and efficient use of resources?**

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**Source:** ACIP Meeting Slide – Feb 2019

**Is the intervention a reasonable and efficient use of resources?**

Workgroup (Judgements):

No       Probably No       Uncertain       Probably Yes       Yes
• Feasibility
  • Current recommendations are complex, but have been integrated
  • Universal age-based recommendations are easier to implement than risk-based
  • Medicare covers both vaccines
    • If change is made, CMS must review and make policy change
  • State regulations regarding nurses and pharmacists tied to ACIP recommendations
  • Effective communications strategies will be needed if changes made

• Is the current intervention feasible to continue?

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Summary of Key Issues

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<th>Reasons Raised in Favor of Discontinuing Routine PCV13 Use</th>
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<td>• PCV13 effective in preventing PCV13-type pneumococcal disease</td>
<td>• Overall impact from vaccinating older adults PCV13 disease is minimal in the context of indirect effects from pediatric PCV use</td>
</tr>
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<td>• Vaccine preventable disease reduced through indirect effects, but not eliminated</td>
<td>• Low remaining burden of vaccine preventable disease limits the potential benefit from direct effects</td>
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<td>• Easier to adhere to universal prevention strategies than to risk-based ones</td>
<td>• Lack of clear population-level impact on disease since 2014</td>
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<td>• Frequent changes to recommendations may negatively impact the perceived importance of future vaccines</td>
<td>• Conservation of resources</td>
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<td>• A more comprehensive approach to adult pneumococcal vaccine recommendations maybe needed (combine changes in a single recommendation)</td>
<td>• Simplification of the recommendations</td>
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</tbody>
</table>
1. We do not recommend the intervention (discontinue PCV13 in adults over 65 years)

2. Recommend based upon individual decision-making (Provider-patient decision)

3. Recommend for all (PCV13 in series with PPSV23 for all adults over 65 years)
Influenza
Last Year’s Season  2017-2018

**FLUVIEW**
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories,
National Summary, 2017-2018 Season

- A (subtyping not performed)
- A (H1N1)pdm09
- A (H3N2)
- H3N2v
- B (lineage not performed)
- B (Victoria Lineage)
- B (Yamagata Lineage)
2017-2018 Influenza Season

- High severity season
  - High ER and Outpatient visits
  - High hospitalization rates
  - High death rate (estimated 80,000 deaths)
  - Extended, widespread activity

https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a4.htm?s_cid=mm6722a4_e#F3_down
2018-2019 Influenza Season (through early March)

https://www.cdc.gov/flu/weekly/index.htm#ILIMap